



3 0864 1006 7855 9

SECOND BIENNIAL REPORT

OF THE

FEB 17 1903

LIBRARY

UNIVERSITY OF MONTANA

State Forester

To His Excellency

EDWIN L. NORRIS

Governor of Montana

For the Years

1911-1912



MONTANA STATE LIBRARY
930 East Lyndale Avenue
Helena, Montana 59601



~~LIBRARY~~

~~OF THE~~

~~STATE UNIVERSITY OF MONTANA~~

~~DISCARDED~~

~~FEB 17 1969~~

~~UNIVERSITY OF MONTANA~~

DATE

TUE

PORT

er

a

~~RECORDED~~

~~FEB 17 1969~~

~~LIBRARY~~

~~UNIVERSITY OF MONTANA~~

For the Years

1911-1912

U197—12M—7-26

LIE

STATE UNIVER

SECOND BIENNIAL REPORT

OF THE

70723

State Forester

To His Excellency

EDWIN L. NORRIS

Governor of Montana

~~RECORDED~~

~~FEB 17 1909~~

~~LIBRARY~~

~~UNIVERSITY OF MONTANA~~

For the Years

1911-1912



Digitized by the Internet Archive
in 2016

Second Biennial Report of the State Forester.

To the Honorable Governor:

In accordance with Section 10, Chapter 147, Laws of 1909, the second biennial report on the condition and progress of the State forestry work, with recommendations for its improvement, is hereby submitted. This report covers the fiscal years from December 1, 1910, to December 1, 1912.

The previous reports of the Forester were largely made up of detail field investigation. The report recommended legislation providing for an adequate forest fire law, which was not enacted.

The greater part of this report deals with the progress that has been made under the old law; most of the work has been toward the control of forest fires, but educational work has also received attention.

It is proposed in this report to show to what extent the forestry interests of the State have been furthered under the existing law, to show the inadequacy of the law to meet all requirements and to set forth the measures that should be adopted to improve the service.

It is not necessary to discuss at any length the primary importance of forest conservation. The need for prompt and vigorous action along this line is clear to all those who know the extent of natural resources, the increasing demand for them, and the rapidity with which they are being destroyed.

When we review the forest resources of the world, we realize that this nation must depend chiefly upon her own supplies. It is an erroneous belief that we may look to other countries for resources after we have ruthlessly destroyed our own forests. An examination of foreign resources shows that they will not long be available since many exporting countries are despoiling their forests as rapidly as we and they will soon have need for all they can produce.

The timber supply of this country is rapidly being depleted. There is much extravagance in the use of forest products. The manufacturers and loggers are wasteful, while the overwhelming loss by fire is a shame to our country. The annual growth

of timber offsets the amount used and destroyed by less than one-third. Briefly, then, we are actually demolishing our forests.

It is the general belief that forestry had never been attempted until the Government began to practice it upon the federal forest. Yet forestry is an ancient study; two thousand years ago it was discussed and it has been applied more and more thoroughly ever since. Today it is practiced in every country in the world excepting Turkey and China. Through it results very necessary to human welfare, that could be brought about in no other way, are obtained. Its principles, resting on natural laws, are always at work everywhere. Forestry in each locality is simply a question of how best to apply these principles to meet the local demands and requirements.

Forestry must ultimately come to all countries, no matter how widely they may differ in size, climate, population, industry or government, if only they have forests.

Taken as a whole, Europe and Asia are rich in forest experience, since they have passed through all stages of forestry and have applied all its principles. In the beginning they did not try to put into practice fine spun theories that they evolved before the time of need, but learned their first lesson by facing hardship. The sharp spur of want, suffering or loss has goaded every country, the world over, on to wiser forest usages. Since this is true, one of the most practical and useful sciences is forestry. Of necessity it is a serious work begun as a measure of relief and continued as a safeguard against future disaster.

Those countries which today care for their forests according to sound principles have, roughly speaking, passed through four stages of forest experience.

At first, because the forests were so abundant as to check the actions of man, they were neglected or destroyed.

Next, settlements sprang up and the forest borders moved farther and farther from the place where wood was needed. Since the problem of fuel must be faced, the people spared and even protected the forests.

Third, the increasing need for wood supplies, together with a better knowledge of forests and their growth, taught the people to look upon their forests as an agricultural crop, which must be harvested and caused to produce again. In this stage,

silvia-culture, or the management of the forest to encourage its best continued growth, was born.

Finally, when natural and industrial progress brought about measures for the general welfare, including a wise and less extravagant use of natural resources, the forest was protected and controlled in such a way as to yield a constant maximum product year after year.

Systematic forestry, therefore, whether practiced by the State or Nation, for the benefit of the people, or applied more and more by far-sighted citizens, results only when the last lesson has been learned in the school of forest experience.

We, then, in attacking the problem of how best to use our great forest resources, are not in the position of pioneers. We have the experience of all other countries to profit by. We do not need to expend time experimenting with untried theories. We have at our command forest principles which centuries of actual practice have proved successful. With us it is merely the question of modifying or extending these principles to fit our peculiar needs.

In the management of forests the ordinary man, who has made a study of United States forestry, is not at a loss to know what to do. Nor need he copy the means of European countries. He can put into practice in America, American principles, which will insure to all the people alike the fullest and best use of forest resources.

I think that a full presentation of the facts at the present time would greatly help in averting the timber shortage that is threatening many communities of the United States.

Timber is a necessity, and in spite of the substitutes that are being made for many of its uses, the amount of timber used today is far greater than ever before, and the demand increases and will increase so long as the supply can be maintained.

The visible supply of timber in the United States is two trillion, eight hundred and twenty-nine billion board feet. The present annual drain upon the supply of saw timber is about fifty billion feet. At this rate, the timber now standing, without allowance for growth, will last only about fifty-five years.

The value of standing timber has increased tenfold and even fifty fold, according to local conditions. We know that the replacement by new growth is very slow, when we consider

that all species now called merchantable and unmerchantable timber average less than 100 feet yearly on each 5,000 feet of stand throughout the United States.

Many destructive agencies are working upon timber. The chief and most destructive is fire; the second is wasteful cutting by lumbermen; third, is decay by the natural law of over-mature age; fourth, fungus growth or disease; fifth, insect disease. These are the leading factors in the destruction of all timber and can be eliminated to a great extent, if properly handled.

The protection of forest property against fire is of the most vital importance in the Pacific Northwest. The damage done to young growth and standing timber is not covered by insurance and is a great loss to the owner and the community. Fire removes the chemical elements so necessary to plant life, from the soil and thus decreases its power of production. Also, the forest mat or seed bed, so important for protecting the seed, is destroyed. The moisture conserving capacity which feeds our springs and which is the source of all water supplies is also lost.

The first necessity in insuring the future forest resources of the State is a system of forest fire patrol. Few people realize the great loss caused by fire in recent years. Unusually disastrous fires do not occur every year. A season of particular fire damage is followed by a period of years wherein no destruction takes place. A drought during the months of June, July and August means severe fire damage to timber.

It is impossible to calculate exactly how much damage has been done to timber in this State, since we have insufficient data at hand and because it is difficult to estimate the damage done to the future timber crop. The aim of this report is to present in as clear a way as possible all the data that could be secured so that each citizen may perceive the importance of the fire problem to the whole state.

The fires that occur within this State do not damage merchantable timber greatly; the greatest harm is the destruction of the young stand. When fire does enter the old stand, it merely kills the trees and chars the trunks, obliging the owners to make immediate sales in order to realize any profit. Because of this many regard the average forest fire as a matter of little importance. Although it is true that much of the

larger fire killed timber may be saved from a forest that, accessible to drivable streams and railroads, has been burned over, yet the fact remains that little can be saved and total loss results when a district is remote from means of transportation. The profit derived from the sale of normal timber exceeds greatly that derived from the forced sale of fire killed timber. This is particularly true when there is little or no demand on the market for timber.

However, far-sighted land owners have taken increased interest in the fire problem and have awakened to the fact that fire means the loss of their future timber crops and hence their profits. It is significant that this interest has increased as the value of the young growing timber has increased.

The extent and character of damage caused by forest fires depends chiefly upon whether it burns deeply into the ground, or runs along the surface of the ground or in the tops of the trees. It also depends largely upon the kind of timber or undergrowth that the fire encounters, upon how dry the forest mat is, and the force of the wind that drives the flames and embers.

The worst fire damage in this state occurs on the slopes of the high hills and mountains. The increasing wind velocity due to the elevation and the steepness of the slopes, causes fires to run very rapidly. Most of the fires start from cut-over lands in the valleys and railroad rights of way, where the debris and dead tops quickly dry out and favor the rapid spread of fire, although a large percentage of fires is caused by settlers clearing land for cultivation.

A bad fire destroys the soil and the accumulated humus which is the soil sponge. This soil sponge absorbs and retains the moisture when sheltered by trees, but when the forest cover is removed it becomes very dry and a fire may destroy it, leaving nothing but gravel and rocks. Many bald hills and bare peaks in the mountain region are the result of fires that have destroyed the soil. It will require centuries to accumulate in such places soil enough to support forest growth. When there is no forest cover or soil sponge to hold back the snow and rain water, the runoff is very rapid, causing erosion and landslides and reducing the land surface to waste and destruction. This reduction of the soil sponge is also the cause of many floods in the valleys that cut away and destroy stream beds.

Usually the soil is not entirely destroyed by fires in the mountains, as they work their worst havoc in destroying the young growing stand and encouraging the inferior growth that generally follows.

The young stand of fir, larch and pine seed is entirely destroyed when one of these slopes is burned over, unless the fire is light and the seed deeply imbedded. As these species grow from seed only, there is no possibility of a new stand of timber if there are no seed trees in the vicinity.

The western portion of Montana is particularly suited to the successful practice of forestry, owing to the vast areas of land that are no fit for agriculture, being high and mountainous with intervening valleys well adapted to forest growth. It is essential to conserve this land for timber growing, not only for the timber itself, but that the water may be maintained and regulated to supply our rivers from the large watersheds of the mountains.

One of the chief factors in lessening our forest resources is wasteful cutting. Under existing conditions timber is cut only to profit those who are interested in the lumber industry, since there is left on the ground after each logging season about 35 per cent of waste material, which could be used to great advantage, if only proper means were provided for its cheaper transportation to other parts of the state, where there is no timber. This need for cheaper transportation has long been felt by the public and should receive consideration since it has many advantages: cheaper material to settlers, revenue to the state, wages for labor, a larger amount of business to the community, and, last but not least, a diminishing of fire hazard on cut over land. The people of the Pacific Northwest have not regarded the possibilities in this waste, called a by-product, but were this by-product, when not destroyed by fire, taken care of, we should experience the same results that the middle western States have experienced.

In the middle western States, where a strict account of the profits of both the virgin stand of timber and the by-product has been kept, it has been found that the latter brought in greater profit than the former. Conditions can be changed only through a low classification of railroad rates on a cheap commodity, which is so important an issue at the time for all forest products and sawmill by-products of the State.

According to the natural law of over mature age, decay of timber is caused by the tendency of matured timber to go backward. By throwing over the young seedlings protection in time of storm and by helping in retaining the moisture for the encouragement of plant growth, matured timber has fulfilled its mission. This kind of timber is, in many districts of the United States, deteriorating fast. The only advantageous course that remains is to cut it and utilize it before no profit can be realized from the salvage. Using up this timber will lessen the drain on the younger stand so that it may increase in growth and in value.

The handling of mature timber can not be looked for at present chiefly because the cost of stumpage is so low when an entire stand is cut at once. However, as the supply shortens in other districts, prices will advance enough to warrant logging mature timber scattered through a forest of virgin stand. This form of logging is expensive as well as tedious. The only course that may encourage this kind of logging is to lessen the cost of stumpage to the logger or manufacturer to offset the cost of the logging operation on such timber. This course would have a twofold purpose; to conserve and to create.

Fungus growth or disease of timber prevails in all districts of this State as well as throughout all other forests of the United States. So far it has been impossible to find means to prevent it. It causes stain and rot to appear as soon as it attacks a tree and this ultimately destroys the commercial value of the timber. In the lower stages of the development of this disease the growth is found in crevices where limbs have emerged in the early life of the tree. In the higher stages of development, the decayed wood within the tree retains moisture at each rainfall and this moisture fosters the increased growth without. It is supposed that this disease is the result of dampness retained in the knots or cavities of limbs which have either been broken off or outgrown from the trees in maturing. Likewise, fungus growth is often found at the base of the tree. This form of the disease causes the base to decay and form a stump rot, which is not nearly so destructive as the form that follows the side of the tree.

Since there is no remedy for this scourge of timber, only one method can be followed—that is to cut the tree in as

early a stage as possible. The sooner cut the more merchantable the timber will be. If not cut, death occurs. Timber of this character should be disposed of according to the same system applied to matured timber, referred to heretofore.

It was discovered a few years ago that insect disease is slowly gaining a stronghold in some districts of our state. In two counties of the State, the *Dendroctus Monticola*, or Rocky Mountain Pine Beetle has made its appearance. It is the most destructive of all species and if left to multiply, it will ultimately destroy a very large portion of our pine forest, which is at present of the greatest commercial value for lumber.

Thus far, the beetle has killed a greater amount of lodge pole pine (*Pinus Contorta*) than any other but recently the invasion has spread to the *Pinus Monticola*. Skeptics regarding the matter have considered these insect depredations a joke. Those who become really acquainted with facts, are brought to the realization that the beetle problem must be dealt with to save our timber.

Death occurs in one or two years after the attack of the beetle. However, if precaution is taken and an available market can be found, salvage may be derived from the timber since it can be manufactured into lumber.

Only one method can be employed in controlling these inroads. While the larva is in the pupa stage, the infected timber should be cut and burned. After June the larva emerges into the beetle. The cutting, then should take place between September and the following June.

Logs cut from the timber affected should be sawed at once and all the debris should be burned if the sawing occurs on the ground where the timber is cut. If the logs are delivered by water, they should be well submerged in order to flood the canal seat of the larva.

Nature has provided a small means in the work of eradicating the pest, in the way of a parasite, but the number of this parasite in comparison with the number of the beetle larva averages only one to forty. It is necessary then, for all those who have the conservation of timber at heart to engage in active work in stamping out these depredations.

How to reach our people on the importance of forest policies is a vital question. Publicity and State laws have done much, but these do not fill all the requirements in reaching the

masses. Forestry is dry reading to the man or woman who has no interest in it. Hence, little study is made by the average person, unless conditions are brought about whereby he is affected in some way. If this issue could be placed before the people squarely in interesting reading, pointing out the interests affected by forestry and all that depends upon it, much more study would be made on this subject. The cost of the distribution of this work would be large if it were carried out to its full extent, but I believe firmly that it would bring results that would be everlasting. The subject in its lower branches should be given more attention in school work. Text books for the young should be used since early training will familiarize the people with forestry to a greater extent. Through the child the parent will come into closer contact with it. Our schools are now full of text books dealing with many subjects of interest to the child, but there is no subject that should have a more prominent place in school work than forestry in its lower branches.

Education by State laws is highly commendable, yet it does not meet the demands, since very few people have taken enough interest in forestry to read the laws covering the subject. It is only in case of violation of the law that many people learn the lesson. Ignorance of forestry and its principles, together with no knowledge of forestry laws, has brought many to grief. It is, therefore, important that this subject be brought before the people, that they may be conversant with this great problem of so much interest in all timber communities.

When the solution of the question of forestry and all that depends upon its fundamental principles has been made by the people, we shall realize that our efforts along the line of education have not been in vain.

When we think of the large acreage of timber land which is widely scattered in the various districts, we realize how important a question fire patrol is to our state. The latest report shows that we have 19,305,100 acres of timber land, of which we have very little knowledge as to its estimate of merchantable timber. A large part of this land, however, is open. For example, bald peaks and mountain sides and grass lands studded with a sparing growth of timber.

Figuring that we had an average of 265 men in the field

in the past two seasons for fire patrol and protection, we have about 70,000 acres on an average for each man to patrol. This patrol service, while quite adequate the past two years will not prove sufficient in normal years, for precipitation was above normal the past two seasons. Considering the area to be patrolled, each man would have to cover a block of land ten and nine-tenths miles square, just twice the area he should patrol in order to give efficient service. If these timber tracts were continuous or in one block, the service might be sufficient, but since they are separated and divided by hills and valleys it is difficult for a patrol man to have full knowledge of conditions in all parts of his territory. This difficulty has been largely overcome by the establishment of Government service, lookout stations on high mountain peaks overlooking the valleys and surrounding country. These stations are connected with other points of the forest by telephone so that warning of fire may be spread. They are also connected with town or city so that a greater force may be called out in case the regular force cannot control the fire. These stations, then, are an important part of our protective work and should be extended and maintained in every district where they can be adopted.

According to the requirements of the law, the appointment of Forest Volunteer Fire Wardens is the first and most important work of this office. These appointments involve much labor, but it is of the encouraging sort, since we realize that each Fire Warden can accomplish much good in his own district. Moreover, it was necessary to have someone look after the fires that were occurring in different parts of the State. To meet the situation, letters were sent out to those who might be interested in the work. Since no compensation was given, our expectations were small. The response was much greater than anticipated. For the season of 1911, from 275 appointments, 208 qualified; for the season of 1912, from 305 appointments, 249 qualified, the majority being Federal Forest Rangers and Fire Guards.

At the same time letters were sent to all Fire Wardens ex-officio, calling attention to the duties connected with their office as prescribed by law.

It has been the aim of this office to secure in each timber locality, men centrally located, who could be reached by tele-

phone and who could quickly get out an efficient crew and handle them effectively in fighting fire. To carry this out it was necessary for the Forester to visit a great many places in the western part of the State to meet the owners of timber land and to appoint the best men who could be secured. In pursuance of this course, other lines of work were carried on while the Volunteer Wardens were being appointed, and as a result a much better corps of Volunteer Wardens has been secured than if the appointments had been made in haste.

The promptness with which the Fire Wardens and Volunteer Wardens have responded to fire calls has rendered their work effective. It is important that the Fire Wardens begin work immediately after the fire begins, to prevent great destruction. It is also important that a fire should be kept well guarded after it is once under control. Great damage has been done by fires, which, thought to be extinguished have smoldered for days and even weeks, only to burst forth with terrible violence when a strong wind came up. In all these particulars the Fire Warden service has been effectual, especially in the more settled districts where help could be quickly summoned. In some communities of the State where fires occur frequently, the Fire Wardens have found it advisable to make arrangements with persons living in different parts of the district to summon help and to begin work immediately in case of a fire, the Warden assuming charge when he arrives.

In fighting fire, various methods are employed to meet the needs of different sections of the State. In the mountains, where a large accumulation of humus makes ground fires particularly hard to extinguish, the digging of trenches with a grub hoe has been found effective. Long handled shovels are often used where the soil is loose and free from rock.

Where the timber is scattered and grass land, over which a surface fire will run, intervenes, plowing with a team is often resorted to. This has the same effect as the trench dug with the grub hoe and is a cheap and swift method.

Back-firing often becomes necessary when a strong wind drives the fire rapidly through the tree-tops. Back-fire may be used when trenching is impracticable. Many Fire Wardens use this method effectively, but it is not advisable to attempt its use unless there is a large enough force of men at hand to keep the back fire under full control, for shifting winds often change the course.

Owing to atmospheric conditions and the low wind, fighting fire at night is considered very profitable. If the crew will work long hours, or if the crew can be divided, having a day and a night division, excellent results are obtained.

The work of posting fire notices, to call attention to violation of forestry laws, has been ably accomplished by the Fire Wardens. During the past two years 3,200 copies have been posted in the forest districts of the State. This cost the State only the price of the notices and the postage to mail them to the Fire Wardens.

This State owes a great gratitude to those Fire Wardens, who without compensation have rendered their aid so efficiently, and I would recommend them to all who have an interest in this great work.

After the appalling horrors and fearful losses of the year of 1910, it was natural to suppose that with the opening of the season of 1911 there would be fair prospects for an amendment to the State forestry laws and that there would be no difficulties encountered in passing measures whereby these losses might be checked to some extent. However, interests that hold the chief part of the timber, outside of the national forest, brought pressure to bear and defeated all forest legislation.

What have the people of Montana done through their legislative body to prevent losses by fire? State losses on State and school lands alone amount to \$155,000.00 on 15,350 acres of merchantable timber, to say nothing of the loss of young stand, which it will cost on an average of \$12.00 per acre to restore. Nor does the loss end here. Large valuable watersheds have been destroyed by fire.

At the last session of the Legislature about \$3,750,000.00 were appropriated to defray the expenses incurred in carrying out the work of the various departments of the State. No appropriation was made to meet an emergency in case of forest fire. I grant that there is need for a large appropriation to carry out State work, but I do urge that the citizens of this State awake to the needs of an adequate appropriation for forest protection and for fostering the lumber industry. We ought not to lose sight of the fact that this industry amounts to \$3,410,000.00 annually to the State. As I survey conditions I realize the important duty resting upon every citizen of doing

his utmost to protect and care for every forest interest in the State.

Montana has about 19,605,100 acres of timber land, of which the greater share is owned by the Federal Government, few companies and private individuals. Estimates covering the amount of merchantable timber on this land have been greatly exaggerated, but we may place it according to a conservative estimate at fifty billion feet west of the continental divide. East of the continental divide there is but a small percentage of merchantable timber. By far the greater portion there will not be marketed for some time, but yet it is of great commercial value, since it will be utilized when shortage occurs in other districts and the demand for fuel and lumber increases.

Comparing private and State ownership with federal ownership of timber land, we find a great difference in care and protection of timber resources. When the timber of any district is cut and manufactured into lumber and other commodities, both the State and the private individual in that district realize great profit, for revenue is turned into the treasury of the State and the individual has wages for his labor. The original profit from the timber, in turn, is distributed into other channels of business. The advantages of this thing are lost sight of through sheer neglect and blindness to good business and our forests, with all their abounding possibilities of resources, are destroyed for the want of care and protection against fire and waste. On the other hand, the Federal Government appropriates funds to carry on the work, has money available at all times to defray expenses of fighting fire and providing patrol work, and finally, through its forest department, has worked out methods by set rules and regulations to perpetuate and conserve forest resources.

There has always been a feeling of hostility in this State toward the Federal Forest Department, but when we think of the future value of timber and the amount of protection that the Federal Department has given to timber land within our boundaries, I believe that you will agree with me that it has done more to save the forest than most people are aware of. A lesson, worthy of being copied by State or individual, may be learned from the methods, but because of selfish ends the lesson is overlooked. As far as protection is concerned, public forest lands and those belonging to private individuals bear an important relation one to the other since no com-

munity can do without timber or the protection of that timber. Disastrous fires in one district affect an adjacent district by exhausting its resources, raising the price of timber and reducing wages and revenue.

The State of Montana and its timber holders will have no reason to feel safe concerning forest protection unless pressure is brought to bear on the next Legislature to pass stringent fire laws.

Under present conditions relief can be secured by following only one course, that of Association work, which has proved rather satisfactory wherever tried. Therefore the aim of this office has been to prevail upon the State Board of Land Commissioners to co-operate with all holders of timber for protection. This they have done as ably as possible under the existing law.

Our first experience here along the lines of Association work occurred during the season of 1911 on 964,160 acres of timber land owned by the Federal Government, the State and private individuals, who co-operated in their work. While the State and individual holdings amounted to only 194,428 acres, yet a levy of $\frac{1}{2}$ cent per acre carried us through the necessary expenses of patrol work and other incidentals. Since the timber lands of the Government are mixed with State and private holdings, it was necessary to co-operate with the Forest Department in order to simplify the work of the three districts formed. Under the agreement the Forestry Department paid 65 per cent of the cost of fighting fires, and the Association 35 per cent. The Government paid for no patrol service of Association men, but in turn the Forestry Department furnished 27 men as patrols, while the Association had four salaried men and four unsalaried men who made reports. Through the efforts of the Association the Northern Pacific Railway Company was induced to place one man in this area for patrol duty. This made a total of 36 men on patrol duty in three districts.

Conditions were unfavorable in the season of 1911 for forest fires, since precipitation was above normal. A great many fires were caused by lightning in the districts referred to heretofore. Six fires originated, but were extinguished since they were caught in the incipient stage. Their origin was due to carelessness of campers, the clearing of lands, sparks from railroads, and the burning of old ties along railroad rights

of way. The area of the land covered by these fires was 199 acres, damage being done to 25,000 feet of timber. The loss amounted to \$35.00. The cost of fighting fires was only \$66.50.

The above facts demonstrate that an effective fire patrol, such as was maintained by our Association in the season of 1911, will fully repay us and is cheap insurance on timber. Speaking for the State of Montana, of the State and school lands, I fully realize the good that has been accomplished by this Association. Our assessment was \$343.61 on 68,721 acres of timber land, representing a value of \$1,340,000.00, which is cheap insurance on this amount of timber.

While this Association is only in its infancy, yet it is bound to grow if proper management and interest are taken by those who have most at stake.

While the conditions of the season of 1911 were unfavorable for fires, yet we find at the close of that year's work for the different forest districts within the State, that a great many fires occurred even though circumstances were unfavorable.

The records of forest fires for the entire state, during the year 1911, including the national forest and State and private timber land—

Number of fires—161.

Number of acres of land burned over—1,383.

Timber damaged—229,000 B. F.

Losses due to fire killed timber—\$3,590.84.

Number of acres of young timber killed—1,152.

Untimbered land burned over—140 acres.

State school land burned over—5 acres.

Damage to school land timber—None. (Only young stand destroyed.)

Private land burned over—1,191 acres.

Timber of private owners destroyed—105,000 B. F.

Losses on private timber—\$255.00.

Expenditures for labor on fires—\$3,230.22.

Expenditures for supplies and tools—\$1,032.93.

Regular fire patrol men in service—278.

Men employed as a whole in field service—413.

Number of arrests for violation of forestry laws—Six. (One conviction; one acquittal; four held for Grand Jury.)

On recommendation to the State Board of Land Commissioners our agreement was continued with the Northern Mon-

tana Forestry Association for the year 1912 on the same basis as that of 1911. And on further recommendation, the State co-operated with the National Forest Service on 309,000 acres at a cost of \$945.03. This amount maintained seven patrolmen in this field for 62 days during the fire season of July, August and September. On the strength of the co-operative agreement with the National Forest Service and the Montana Forestry Association, application for an allotment of funds was made under the "Week's Law." However, because of technicalities in the application, we did not receive the benefits we should have realized if an agreement had been entered into.

The season of 1912 opened with discouraging weather conditions since precipitation was far below normal. During the months of April, May and June very little rain fell. The forest was very dry during that season and most of our forest fires occurred then. However, during the latter part of June and the rest of the season a great amount of rain fell and kept forest fires below normal. The record for this season is as follows—

Number of fires during season—135.

Number of acres burned over—1,001.

Timber damaged on National and State forest lands—47,000 B. F.

Losses due to fires—\$3,371.00.

Salvage to be derived from losses—20 per cent.

Timber land burned over, young stand killed—66 per cent.

Land burned over not timbered—21 per cent.

State land burned over—90 acres.

Damage to school land timber—None. (Only young stand destroyed.)

Private land burned over—851 acres.

Losses on private timber—\$3,371.00.

Number of fires on private land threatened State and National forest—76.

Expenditure for labor on fire—\$1,095.78.

Expenditure for supplies and tools—\$667.33.

Men employed for fire service—164.

Regular fire patrol men in service—251.

Men employed as a whole in field service—395.

Number of men serving as State Fire Wardens (excluding Ex-officio Fire Wardens)—249.

Number of arrests for violation of forestry laws—One.

Number of convictions—One.

The work of this office and of the field force has been varied owing to the fires of 1910 and to the great amount of trespass that has been committed on State and school land within recent years.

The former has taken a great deal of valuable time, since there was but little definite knowledge at the close of the year of 1910, as to the area and damage done to State timber lands. However, up to the close of this year, investigation discloses that we have 15,350 acres burned over timber aggregating 51,000,000 B. F. Of this amount ten per cent has been sold up-to-date.

Every effort has been taken to sell this timber by way of correspondence and visits in order to make inducements to purchasers, but the work has almost been a failure due to the market conditions, which have been the worst in the history of the State. There is but little hope, unless this timber is sold soon, to realize salvage from it, as it is fast deteriorating and going to waste. Some of this timber is remote and cannot be reached since there are no facilities to get it to market. It, then, will be a total loss to the State.

Dealing with the matter of trespass on State lands, investigations disclose to the field force and me that there is hardly a district within the State which has not at some time or other been invaded by vandals or thieves.

Destroying or taking timber from State lands is a common occurrence. A great deal of this destruction took place many years ago, while there are traces of very recent trespass and damage done, also. Both are very hard to get at, owing to the time of cutting and ignorance of whom it was done by.

In the majority of cases the trespasses are not large, but many taken together make a large total sum.

In ninety per cent of the cases investigated where the parties had removed timber from the State land they gave the pretext that they cut the timber unintentionally.

At this time I do not think there is any good reason why people should trespass on State land, since the surveys of the Government have been fairly well done and as a rule the lines established are fairly plain.

Reviewing the situation as I do, on wholesale trespassing,

such as has been committed where parties have been settled with for a nominal sum, only gives prestige to the repetition of trespass. For illustration, State timber cut near streams can be logged very cheaply, and advantage is taken and will be taken just so long as available State timber is near streams and railroads.

The extent of trespass discovered during the past two years has been remarkable, amounting to 63 of which here have been 14 settled for, aggregating 1,005,950 feet amounting to \$2,751.35, averaging \$2.73½ per thousand B. M. Some of the rest of these are under investigation, while others of them have been outlawed by statute limitation. The other field work accomplished during the past two years has been extensive estimating of timber and appraising forest land, which have taken 75 per cent of all the time of the field force. The rest of the time has been devoted to trespass, surveying, scaling of timber and duties pertaining to timber permits for domestic use.

TIMBER ESTIMATED DURING THE YEARS 1911-1912.

Number of acres estimated 53,648.50, aggregating \$288,384,000 feet.

Total cost, \$5,279.97; average per acre 98-10 cts.

Estimated appraised valuation timber—\$2.51 3-10 per M.

Total timber and land value—\$1,123,183.22.

Estimate appraised value timber land per acre—\$7.42 3-4.

Stand of timber by species:

Yellow Pine	32%
White Pine	02%
Larch	50%
Fir	11%
Spruce	03%
Miscellaneous	02%
	<hr/>
	100%

The high cost of estimating of timber, as this report indicates is due to the fact that the estimating has covered various parts of the State, which entailed a great deal of traveling expense as well as that of maintaining a team for a camping outfit.

Since no report was furnished on the amount of timber estimated for the years of 1909 and 1910, I herewith submit a report covering the two years to show the contrast in the amount of work accomplished in the two different periods.

TIMBER ESTIMATES—1909 AND 1910.

Number of acres estimated—42,456.08, aggregating 304,235,000 feet.

Estimate value of timber—\$3.00 per M. \$912,705.00.

Estimate value of timber land—\$6.40 per acre \$271,718.91.

Total timber and land value—\$1,184,423.91.

The different values of timber and land of the two periods are due to the fact that in the two former years, a better class of timber and land was encountered.

Section 10 of the Forestry Law provides that the State Forester "shall deliver a course of at least six lectures on practical forestry to the students attending the State University, the State Agricultural College, and the State Normal School, during each school year." In carrying this law into effect it soon became evident that the means at hand would not meet the demands for information and assistance which were being received from the people. Most of the forester's time was taken up in organizing fire service and other details systemizing the Forestry work of the state. The educational work could not be pushed to a point where it would interfere with the fire protection work and there was only a limited time for cooperative work.

Lectures and Talks.

The interest in Forestry is reflected by the number of lectures and talks which the State Forester has been asked to give. This part of the work is producing good results and should be extended. At most meetings a live interest is taken and the questions asked indicate that the small timber land owners are awakening to the practical value of forestry. The most interesting meetings were the most informal where the audience entered into a general discussion of the subject. All of these requests could not be accepted on account of the time taken in the fire protection work and other details of the office. However, engagements were filled at the State University, and at forestry meetings within and without the state, so far as time would admit. When engagements could not be filled, papers were submitted on forestry work.

The past two years have been favorable to the growth and development of forestry. The interest of the people in the work of fire protection has increased, which is shown by the reports gathered from all forest districts of the state. There is a general feeling for an amendment to our Forestry Laws, which will make the present law effective.

Financial Statement.

Receipts—

From sale of green timber, 1911	\$23,647.34
From sale of fire killed timber, 1911	550.00
Domestic timber permits, 1911	283.64
Timber trespass, 1911	1,776.48
Cordwood sales, 1911	133.75
Cordwood trespass, 1911	10.00
	<hr/>
	\$26,401.21

Disbursements—Dec. 1, 1910, to Dec. 1, 1911.

Timber estimating	\$3,122.83
Timber estimating—Exp. acct.	1,143.46
Forest fire protection	540.28
Fire bills, 1910	302.87
Forester's salary	2,499.96
Forester's office and trav. exp.	1,178.05
	<hr/>
	\$8,787.45—\$ 8,787.45
	<hr/>
	\$17,613.76

Receipts—

From sale of green timber, 1912	\$ 1,518.73
From sale of fire killed timber	2,439.39
Domestic timber permits	603.31
Timber trespass	974.87
Cordwood sales	10.00
Cordwood trespass	6.00
	<hr/>
	\$23,166.06

Disbursements—Dec. 1, 1911, to Dec. 1, 1912.

Timber estimating	\$1,928.88
Timber estimating—Exp. acct.	844.80
Forest fire protection	1,288.64
Beetle eradication	550.00
Forester's salary	2,500.00
Forester's office and trav. exp.	930.89
	<hr/>
	\$8,043.21—\$ 8,043.21
	<hr/>

Balance December 1, 1912 \$15,122.85

CHAS. W. JUNGBERG,
State Forester.

RECOMMENDATIONS.

Control of Forest Fires.

We recommend:

1. District Fire Organization. That the state be divided into nine or ten fire districts according to watersheds and that a chief fire warden be appointed for each district, on a salary, who shall, under the direction of the State Forester, have charge of all protective forestry work within said district.

2. Lookout Stations. That the state cooperate with the Federal Government and private owners of timber in the establishment and maintenance of lookout stations and rights of way for trails and telephone lines.

3. Railroad Fires. That cooperative measures be taken by the state and the railroads toward the diminuation of fire damages from locomotive and rubbish along rights of way and that the railroad officials be invited by the Governor to participate with the Forestry Board in an investigation of adequate means for protection.

4. Lopping Limbs and Branches. That in all lumber operations where timber is felled that the limbs and branches shall be lopped off from the felled tops so that the stem of the tree shall rest on the ground.

5. Prevention. That supply stations, containing tools used in fire fighting and provisions necessary for men employed be established at advantageous points throughout the state; that proper maps be made and placed in the hands of the district forest fire wardens; that fire trails be built, that paid patrol be employed at suitable points and at necessary times, and that a separate appropriation be made for these purposes, to be used at the discretion of the State Land Board. These provisions are particularly necessary for the present state and school lands.

6. Burning Brush. That as a means of preventing the large number of fires caused by brush burning there shall be an open and closed season for burning brush, June 1st to September 15th being the closed season.

7. Spark Arresters. That spark arresters be used on all steam engines operating on or through forest land. That oil burning locomotives be used in all operations of railroading during the closed season or time of drought.

8. Co-operation. That co-operation between State, Federal Government and private individuals for fire protection be extended on pro rata basis of acreage cost to fight fires and maintain patrol service. Application for an allotment of funds under the "Week's Law" by the State Board of Land Commissioners for the protection of the watersheds of the large navigable rivers of the state.

9. Fund for Fire Service. That available funds be ready to pay off men promptly when service of fighting fires has ended. Also available funds at all times to fight fires without the express permission of the State Board of Land Commissioners.

10. Destructive Agencies. That State cooperate with Federal Forest Department and private individuals in eradicating and destroying the beetle insects. Expenses borne equally on the acreage basis.

11. Railroad Freight Rate. That freight rate be lowered on by-products from forest land and on low grade of lumber and by-products from saw mills.

12. Timber Trespass. That individuals guilty of trespassing pay the full penalty of three times the appraised value of timber, where it is found on conclusive evidence that such trespasses were committed wilfully, or that through sheer neglect they have failed to have their lines surveyed by a competent surveyor.

13. Field Force. That a larger field force be employed for the coming season to estimate standing timber of the state.

14. Publicity Work. That publicity work be extended in the form of bulletins and publications on forest fire work.

15. Forest Laws. That forestry laws be amended and a law passed that will meet general requirements of all forest land within the state and that will place the burden of tax on timber land holders.

16. Office Help. That an assistant be employed during period from April 1st to October 1st to help the State Forester in carrying out the following work: (a) Field and office work necessary during the forest fire season; (b) gathering data for bulletin; (c) making maps; (d) caring for and improving forest land owned by the state.

LIBRARY
University of Montana
FEB 1 1953
LIBRARY
UNIVERSITY OF MONTANA

